carry more information than normal bursts or abbreviated bursts, thus increasing the throughput capacity of the system.

The use of normal, abbreviated, and auxiliary bursts will now be described with reference to FIG. **10**, which illustrates burst usage for full-rate transmission, double-rate transmission and triple-rate transmission in cells covering a small geographical area, for example, cells which have diameters of less than 10 miles (16 km). For a full rate transmission, the mobile station may, for example, be allocated timeslots **1** and **4** to transmit on. In this case, the mobile station would use normal bursts so as to avoid collisions with bursts received from other mobile stations in, for example, timeslot **3** and timeslot **6**. However, according to the invention, auxiliary bursts can be used in the double rate transmission and the triple rate transmission to increase the throughput capacity of the system. For example, when a mobile station is in a triple rate transmission mode, the mobile station transmits its message in consecutive bursts until the message is complete. In this example, the message is made up of eight bursts which are transmitted in consecutive timeslots **1**, **2**, **3**, **4**, **5**, **6**, **1**, and **2**. The start of the message is sent as a normal burst, which has the specified ramp up time and guard time. This ramp up time and guard time ensures that the normal burst does not collide with the user of prior timeslot **6** (not illustrated). In addition, the normal burst also provides synchronization between the mobile station and the base station through the 28-bit synchronization fields and the 24-bit additional synchronization field. Since the basic level of synchronization and the nominal received power level has been established by the normal burst, the mobile station can use consecutive auxiliary bursts to complete the transmission of the data. Since the auxiliary bursts do not contain guard time or ramp up time or extra synchronization, more of the auxiliary burst can be used to transmit data. Thus, the throughput capacity of the system has been increased. For small cells, the last burst is an auxiliary burst. While there is no explicit ramp down time provided in the auxiliary burst, the auxiliary burst will need some time to ramp down. However, this ramp down period can coincide with the ramp up period of the next normal burst being transmitted by another mobile station in the next timeslot.

In the double-rate example, the mobile station transmits its data in pairs of bursts. The first burst of each pair is preferably a normal burst, since there is a need to have the proper guard and ramp time so that the normal burst does not collide with a burst from another mobile station which could be transmitting in timeslots **3** and **6**. However, since the system has already gained the basic level of synchronization and the nominal received power level with a normal burst, the second burst in each pair can be an auxiliary burst, thus increasing the throughput capacity of the system during double-rate transmission.

As noted above, large geographical cells use abbreviated bursts to avoid collisions, and suffer decreased throughput as a result. However, according to the invention, normal bursts, abbreviated bursts and auxiliary bursts can be used in large cells (radii greater than about 10 miles) depending upon whether the mobile station is transmitting at full rate, double-rate or triple-rate. When the mobile station is operating at full-rate, an abbreviated burst is used, since the burst in the next slot will be from a different mobile station. During double-rate transmission, a normal burst can be used as the first burst, i.e., no extra guard time, in each pair of bursts since the next burst in the pair is from the same mobile station. However, the second burst in the burst pair is an abbreviated burst since the next burst will be from another mobile station. In the alternative, an abbreviated burst could be followed by a time shifted auxiliary burst during double-rate transmission. The auxiliary burst would have to be shifted so that the start of the auxiliary burst coincides with the end of the active portion (data field) of the abbreviated burst. However, this would require the mobile station to define a new start time for burst transmittal. While such an alternative is acceptable from a system point of view, the use of a normal burst and an abbreviated burst is preferred because it maintains the existing transmit phase. Another alternative would be to transmit an auxiliary burst followed by an abbreviated burst. While the abbreviated burst would not interfere with the next burst, this alternative is not preferred since the auxiliary burst lacks the requisite guard time at the beginning of the burst.

In triple rate transmission, a normal burst is used for the first burst so as to provide the proper guard time and ramp up time needed so as not to collide with the end of a previous burst. However, after the first burst, auxiliary bursts can be used in every slot except for the last slot, which is an abbreviated burst so as to provide the needed guard time at the end of the transmission. As illustrated in FIG. **11**, a mobile station operating at triple rate transmission with a message which requires seven bursts to transmit, can first transmit a normal burst followed by five auxiliary bursts, finishing up with an abbreviated burst. By using the five auxiliary bursts, the throughput capacity of the system is increased.

As described above, a mobile station can transmit information using a normal burst, an abbreviated burst, or an auxiliary burst. As a result, the base station or receiver needs to be able to determine what type of burst is being transmitted in order to correctly determine the information contained therein. The burst usage is a function of the channel rate (full-rate, double-rate, triple-rate), the transmission rate of a particular mobile station, and the scheduling of the reverse channel by the base station by controlling feedback information such as channel packet feedback (PCF) information as described in U.S. patent application Ser. No. 08/544,836, entitled "Packet Channel Feedback" which is incorporated herein by reference. Thus, the decoder section of the base station must be informed of the expected burst format or perform a burst-type estimation process. Relevant sections of a base station **200** are illustrated in FIG. **12**. According to the invention, this determination can be implemented in several ways. First, the reverse channel scheduling section **210** of the base station **200**, which controls the PCF information, may inform the decoder section **220** of the base station what burst format it will receive. Secondly, the decoder **220** of the base station may detect the presence or absence of various physical layer fields such as guard, ramp, preamble, SYNC+ and thus make a decision on what type of burst format is being used before performing channel decoding. In addition, the decoder **220** could synchronize, demodulate and channel decode the received burst according to all possible burst formats. In this implementation, the cyclic redundancy check (CRC) is checked in layer **2** to determine which format was used. If all of the CRCs are incorrect, the burst would have been lost regardless of the knowledge or lack thereof, about the burst format.

When a frame is not properly received, a retransmission of the frame should be performed using the same burst format. The first burst in an access attempt is required to be correctly received before additional bursts are transmitted. Thus, the first frame is resent using the same burst format. Since normal bursts are only used as first bursts, a normal